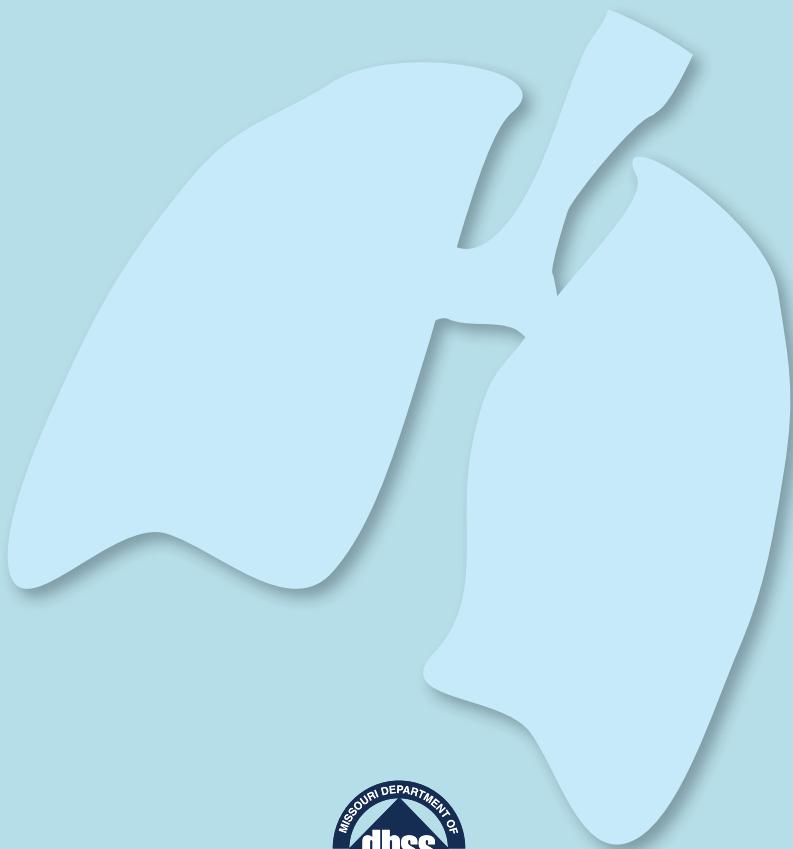




# Issue Brief: Teaming Up for Asthma Control An Outlook/Analysis by Urban and Rural School Zip Codes

Missouri Asthma Prevention and Control Program



**Missouri Department of Health and Senior Services  
Missouri Asthma Prevention and Control Program (MAPCP)  
920 Wildwood, P. O. Box 570  
Jefferson City, Missouri 65102-0570**

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# Issue Brief: Teaming Up for Asthma Control An Outlook/Analysis by Urban and Rural School Zip Codes

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# Project

Teaming Up for Asthma Control (TUAC): An analysis of asthma assessment and management training completed by school nurses and staff, by rural and urban school zip codes.

## Primary Evaluation Questions

1. Is the Teaming Up for Asthma Control training reaching its priority population - school nurses?
2. What is the geographical rural-urban makeup of school nurses and staff completing face-to-face and online Teaming Up for Asthma Control trainings?
3. How does the geographical locations of trained school staff compare to asthma emergency department visit county rates among children 14 years of age and younger?

## For More Information

Sherri Homan, RN, FNP, PhD  
Public Health Epidemiologist  
Missouri Asthma Prevention and Control Program  
[Sherri.Homan@health.mo.gov](mailto:Sherri.Homan@health.mo.gov)  
573.522.2810

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# Summary of Findings

Participants' School Zip Codes	
Urban	
83.8% MABLE	
83.2% RUCA	
Rural	
16.2% MABLE	
16.8% RUCA	

**53.7%**

*A majority of school nurses and staff completed the TUAC asthma training online.*

The Teaming Up for Asthma Control (TUAC) education is reaching a priority training group - school nurses with RNs and LPNs comprising 88.6 percent of the participants completing training (2011-2014) and representing about one-fourth of all school nurses in Missouri.<sup>1</sup> The majority of participants were from schools in urban areas. The two systems used for classifying participants' school zip codes (Master Area Block Level Equivalency (MABLE)<sup>2</sup> and the Rural-Urban Commuting Area (RUCA)<sup>3</sup> systems) produced similar results. Although, 15.5 percent more school nurses and twice as many from rural areas completed the TUAC training online, the number attending face-to-face (n=232) is a good indication that both types of training are useful.

TUAC is a work force development intervention aimed at promoting school nurse competency for assessing and caring for students with asthma. The aim is to improve asthma control by increasing monitoring by an asthma-trained school nurse, promoting asthma literacy using culturally appropriate material and messages, and enhancing self-care behaviors among students with persistent asthma in grades K to 6 and their families. The messages and assessment procedures are aligned with National Heart, Lung, Blood Institute (NHLBI) Guidelines for the Diagnosis and Management of Asthma (EPR3).

The training uses standardized modules combined with an asthma literacy program and focuses on key messages: daily inhaled corticosteroid use improves asthma control, the importance of objective measures of airflow and proper inhalation technique, and trigger avoidance to reduce exacerbations. This training provides core asthma competencies to school nurses through: highlights from the EPR3 guidelines, student curriculum, scenarios and demonstrations of non-invasive asthma equipment. Upon successful completion of the training, the nurse is awarded 2.5 hours of continuing education units and receives equipment and curriculum at no cost. The purpose of this analysis was to determine the rural-urban geographical location of TUAC training participants based on their school zip codes in relation to geographic high needs areas.

# Recommendations

There are many potential factors impacting these results; however, some efforts to increase interest and completion of asthma training by school nurses and other school personnel may include:

- Greater promotion of online training particularly in rural areas.
- Explore new avenues of disseminating information on asthma in Missouri schools and communities to increase awareness.
- Develop priority training areas based on a summary rating of key indicators.
- Implement follow-up to the training program to assess impact -application of information, changes in policies and practices and health outcomes.

*“The program needs to promote online training in rural areas.”*



# Evaluation Methods

School zip codes of 500 of the 501 training participants were classified into urban and rural categories.

A list of school zip codes was generated for school nurses completing the TUAC asthma training from the Asthma Ready Communities (ARC)<sup>1</sup> database. Two classification systems were used to assign zip codes as urban or rural: (1) MABLE<sup>2</sup> version 1.2, 2012 and (2) the 2010 RUCA Codes 3.0. MABLE/Geocorr 12: Geographic Correspondence Engine uses census 2010 (or later) data and is a web-based application for translating data between different geographic layers. The first step was to select a state, Missouri was selected. Next, the source geocode was selected as the 5-digit zip/Zip Code Tabulation Area (ZCTA) Zip Census tab Area 2010. The target geocode was selected as urban rural portion (2012) and the 2010 census population was selected. In the final step, a listing file of zip codes and city names was generated by percent urban and rural. The school zip codes of participants were classified according to the majority rating of rural or urban (50% or more). This same process was completed for two neighboring states with zip codes in the TUAC training database.

The 2010 RUCA codes for delineating sub-county components of rural and urban areas uses the same theoretical concepts used to define county-level metropolitan and micropolitan areas. The 2010 RUCA codes data are from the 2010 decennial census and the 2006-2010 American Community Survey. The classification contains 10 primary and 21 secondary codes with the secondary codes used for this evaluation. A four category classification was completed initially by aggregating the secondary codes using the map classification shown in Table 1. A two category classification followed by combining tiers 1 and 2 for urban and 3 and 4 for rural. Analysis was completed using IBM SPSS Statistics 20 (IBM Corporation, Armonk, NY).

# Evaluation Methods cont.

**Table 1. Four Category Classification Using 2010 Rural-Urban Commuting Area Codes 3.0**

Class	Tier	Secondary RUCA Codes
<i>Urban Core</i>	1	1.0, 1.1
<i>Sub-Urban</i>	2	2.0, 2.1, 3.0, 4.1, 5.1, 7.1, 8.1, 10.1
<i>Large Rural Town</i>	3	4.0, 5.0, 6.0
<i>Small Town/Isolated Rural Areas</i>	4	7.0, 7.2, 8.0, 8.2, 9.0, 10.0, 10.2, 10.3

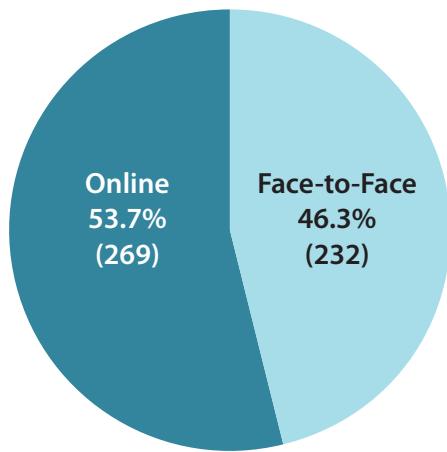
A list of all the school buildings was obtained from the Missouri Comprehensive Data System<sup>4</sup> to compare rural-urban locality of participants' schools with all schools in Missouri and coded using the secondary RUCA codes. To compare the TUAC trained participants with areas with high emergency room visit rates for children age 14 and younger, data were obtained from the Missouri Information for Community Assessment (MICA)<sup>5</sup> data portal on the DHSS website. The number of school nurses was obtained from the 2012-2013 public school statistics.<sup>6</sup>

School zip codes were generated for school nurses completing the TUAC training from the Asthma Ready Communities (ARC) database.



# Results

**Figure 1. School Nurses and Others Completing TUAC Training by Type of Training (N=501)**



**Table 2. Nurses and Staff Completing TUAC Training by State Location of School Zip Code**

	Frequency	Percent	Valid Percent
<i>Missouri</i>	498	99.4	99.6
<i>Tennessee</i>	1	.2	.2
<i>Kansas</i>	1	.2	.2
<b>Total</b>	500	99.8	100.0
Missing System	1	.2	
<b>Total</b>	501	100.0	

## About the Respondents

A total of 501 nurses and staff completed the TUAC asthma training January 10, 2011, through April 7, 2014. An overwhelming majority of those completing the training were nurses (88.6%: RNs 75.0% and LPNs 13.6%). More than one-half of school nurses and staff completed the TUAC training online (53.7%) (Figure 1). Most of the nurses and staff completing the training worked in a Missouri school (99.4%) (Table 2). Only one person completing the TUAC training did not provide a school zip code.

# Results

According to the MABLE classification system, based on the participants' school zip codes, the majority of nurses and staff completing the TUAC online or face-to-face training worked in schools located in urban areas (83.8%) (Table 3).

Using the 2010 Rural-Urban Commuting Area secondary codes 3.0 and the four category rural-urban classification scheme for zip codes, the majority of nurses and staff completing TUAC training were from urban core schools (69.2%) (Table 4).

**Table 3. School Nurses Completing TUAC Training by MABLE Rural-Urban Classification of School Zip Codes**

	Frequency	Percent	Valid Percent
<i>Rural</i>	81	16.2	16.2
<i>Urban</i>	419	83.6	83.8
<b>Total</b>	500	99.8	100.0
Missing System	1	.2	
<b>Total</b>	501	100.0	

**Table 4. School Nurses Completing TUAC Training by Four Category Rural-Urban Commuting Area Secondary Codes of School Zip Codes**

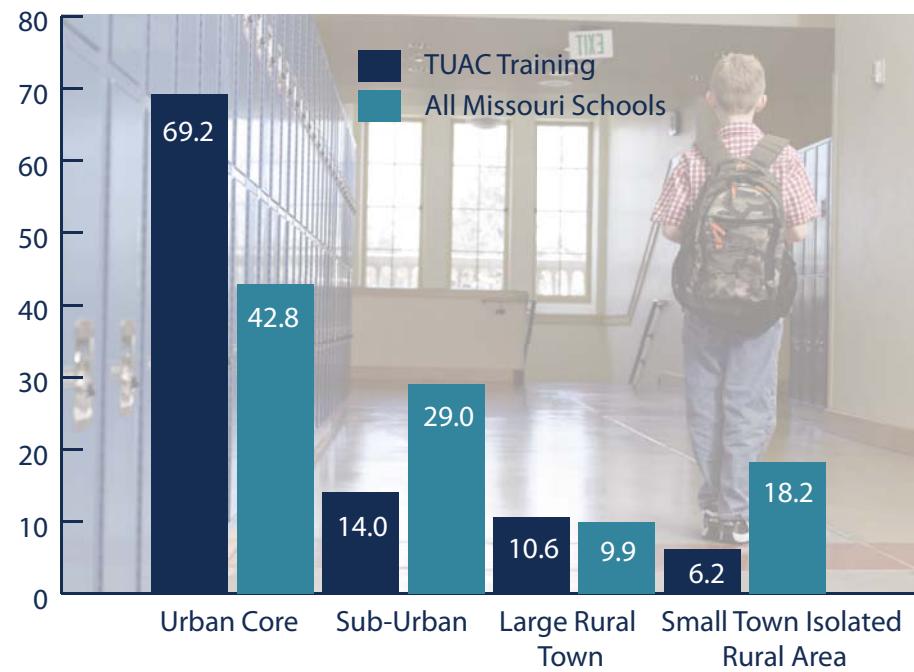
	Frequency	Percent	Valid Percent
<i>Urban Core</i>	346	69.1	69.2
<i>Sub-Urban</i>	70	14.0	14.0
<i>Large Rural Town</i>	53	10.6	10.6
<i>Small Town-Isolated</i>			
<i>Rural Area</i>	31	6.2	6.2
<b>Total</b>	500	99.8	100.0
Missing System	1	.2	
<b>Total</b>	501	100.0	

# Results

When compared to all school buildings in Missouri ( $N = 2,369$ ), there was a greater proportion of TUAC trained school nurses from urban core schools than Missouri school buildings located in urban core areas (Figure 2).

There was a greater proportion of TUAC trained school nurses from urban core schools.

**Figure 2. Comparison of School Nurses Completing TUAC Training and All Missouri School Buildings by Four Category Rural-Urban Commuting Area Secondary Codes**



# Results

**Table 5. School Nurses Completing TUAC Training Using School Zip Codes by Two Category of Rural-Urban Commuting Area Secondary Codes**

	Frequency	Percent	Valid Percent
Rural	84	16.8	16.8
Urban	416	83.0	83.0
<b>Total</b>	500	99.8	100.0
Missing System	1	.2	
<b>Total</b>	501	100.0	

**Table 6. School Nurses and Staff Completing TUAC Training by Type of Training and Rural-Urban Commuting Areas**

Training		Frequency	Percent	Valid Percent
<i>Online TUAC</i>	<i>Urban</i>	209	77.7	78.0
	<i>Rural</i>	59	21.9	22.0
	<b>Total</b>	268	99.6	100.0
	Missing System	1	.4	
	<b>Total</b>	269	100.0	
<i>Face-to-Face TUAC</i>	<i>Urban</i>	207	89.2	89.2
	<i>Rural</i>	25	10.8	10.8
	<b>Total</b>	232	100.0	100.0

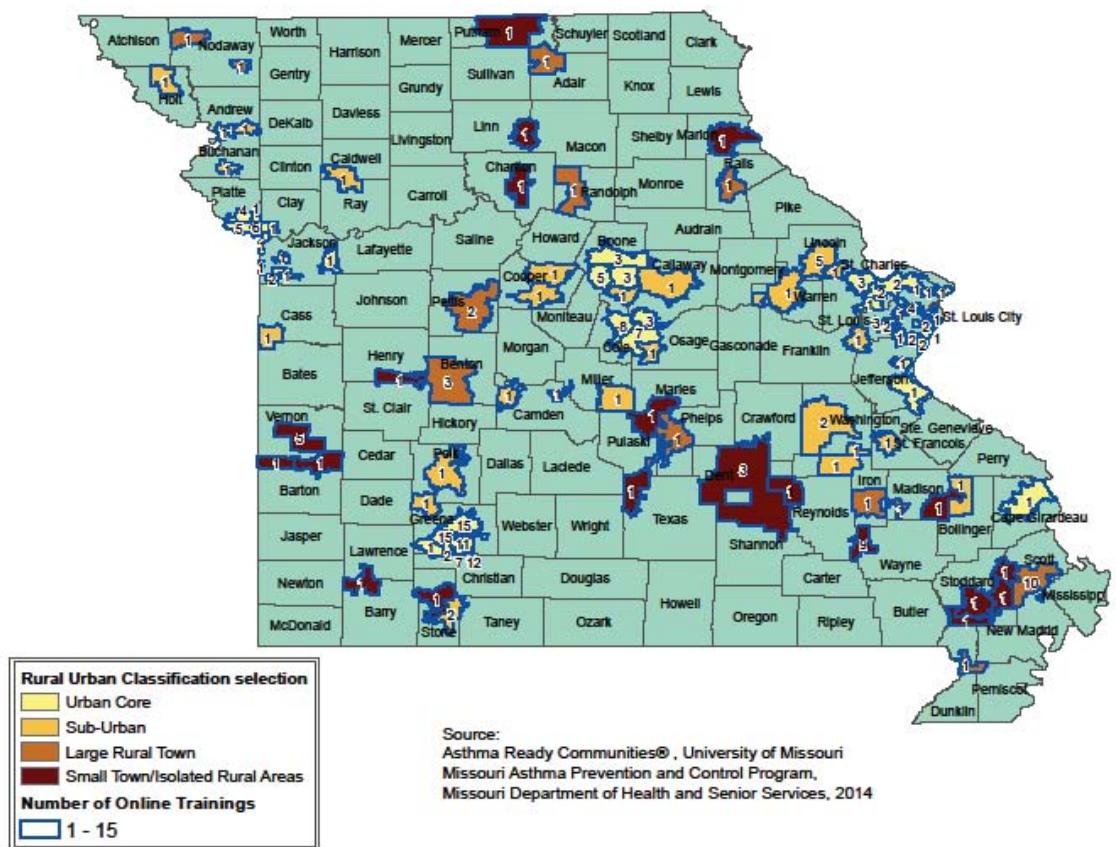
Table 5 shows the results when the four RUCA categories were combined to create a two category urban (levels 1 and 2) and rural (levels 3 and 4) classification for school zip codes of school nurses and staff completing TUAC training. According to the RUCA zip code classification system the majority of school staff completing TUAC online and face-to-face training worked in schools located in urban areas (83.0%). These results are similar to the results obtained using the MABLE rural-urban classification system (Table 3).

Based on RUCA system, twice as many school nurses and staff in rural areas completed the TUAC online training (22.0%) than the face-to-face training (10.8%) (Table 6).

# Results

Figure 3 shows the geographic locations of school nurses and staff completing the TUAC online training.

**Figure 3. Online Asthma Training Participants by School Zip Codes, 2011-2014**



# Results

**Figure 4. Face-to-Face Asthma Training Provided by Zip Codes**

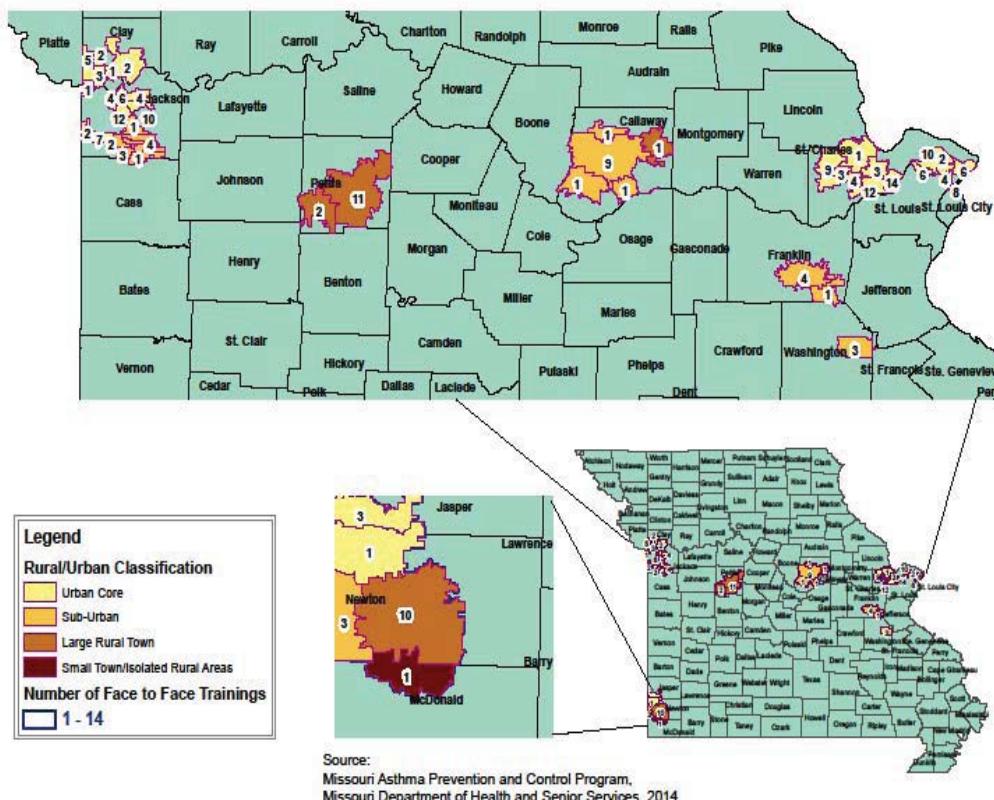
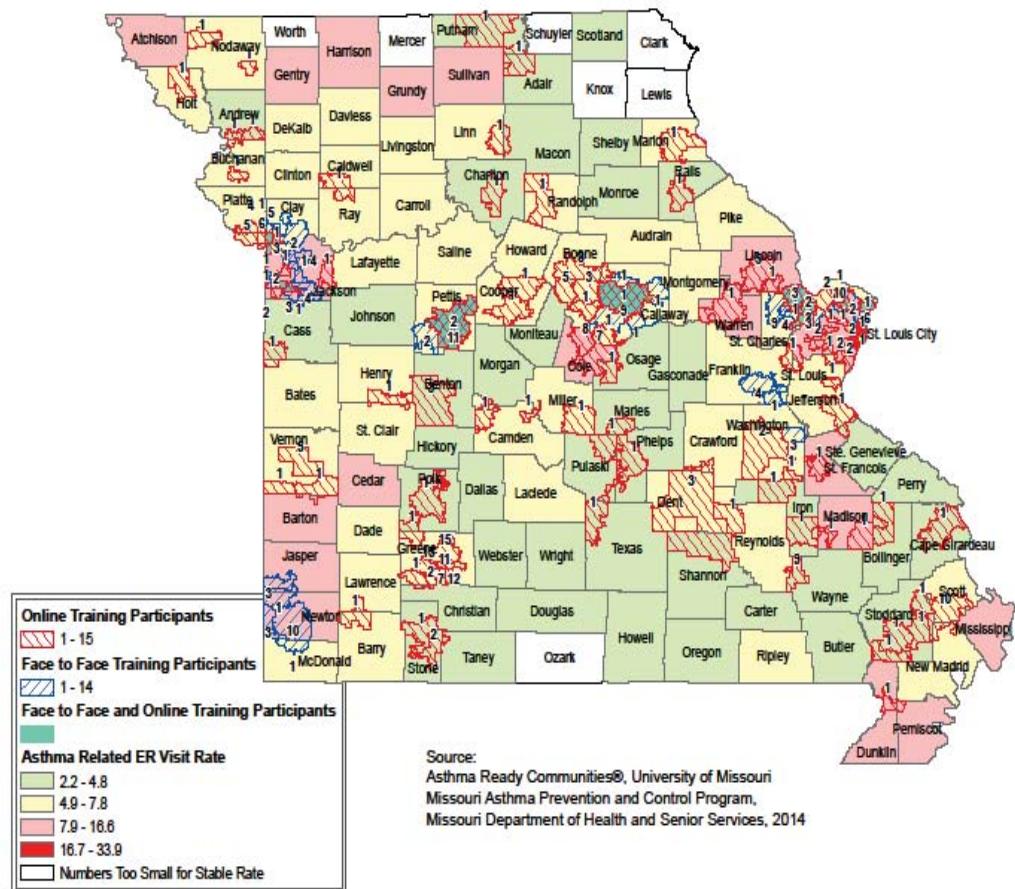


Figure 4 shows the geographic location of school nurses and others completing the TUAC face-to-face training. There is a greater geographic dispersion of participants completing the online course.

# Results

Figure 5 shows the school nurses and staff that have completed TUAC training in relation to asthma ER visit rates by county for children age 14 and younger (2006-2012). The highest rate of asthma ER visits for this seven-year period was in St. Louis City (33.9/1,000) followed by St. Louis (16.6), Jackson (15.1), Madison (11.6) and Pemiscot (10.7) Counties. Seven counties had less than 20 asthma ER visits among children age 14 and younger during this time period: Clark, Knox, Lewis, Mercer, Ozark, Schuyler and Worth Counties. Of the 20 Missouri counties with a childhood asthma ER rate of 7.9 per 1,000 population or greater during this time period, 13 (65%) of these counties have had one or more school nurses complete asthma training. However, there are still counties, particularly in the northwest area of the state, with high childhood asthma ER rates that have not had any school nurses or staff trained through this program that may benefit from this training.

**Figure 5. Asthma ER Visit Rates for Children Age 14 and Younger by County and Number of Training Participants by School Zip Codes, 2011-2014**



# Conclusion and Limitations

The target audience for the TUAC asthma assessment and management training is school nurses. There are approximately 1,752 school nurses in Missouri and approximately one-fourth (25.3%) of Missouri school nurses have been reached with this training. In this study, the two methods for classifying rural and urban areas of school nurses completing the TUAC training using school zip codes yielded comparable results which added validity to the finding that most of the nurses and staff completing the training were from urban areas. However, both types of training had large numbers of participants indicating both training approaches were beneficial. The broad geographic distribution of participants indicates the training reached a diverse set of schools, particularly the online training. Although many priority counties based on childhood asthma ER visit rates have been reached with training, there are still counties with high risk populations that may benefit from additional school nurses being trained.

This is a descriptive study only so the impact of the training is not considered.

## Limitations

A wide range of asthma trainings are available in Missouri, only the TUAC training participants were included in this study and are shown on maps. There are many additional individuals that have received asthma training and would show even greater coverage for the state.

While this study included all participants that received TUAC training, it will be important to repeat this analysis for the schools and school nurses that participated in the TUAC evaluation and received additional mentoring and training and compare the impact between these two groups (i.e., training only participants versus training plus evaluation participants).

# Contributors

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This evaluation project was made possible through a collaboration of MAPCP staff and partners. The following individuals made important contributions to the development and implementation of this project, including developing and delivering the asthma education curriculum, data analysis and report writing.

Ben Francisco, PhD, PNP-BC, AE-C, Director, Teaming Up for Asthma Control, University of Missouri

Tammy Rood, NP, MSN, AE-C, Program Coordinator, Teaming Up for Asthma Control, University of Missouri

Sherri Homan, PhD, RN, Public Health Epidemiologist, Missouri Department of Health and Senior Services

Noaman Kayani, PhD, Research Analyst, Missouri Department of Health and Senior Services

Julie Patterson, Administrative Coordinator, Teaming Up for Asthma Control, University of Missouri

Paul Foreman, PhD, Evaluator, Teaming Up for Asthma Control, University of Missouri

Eric S. Armbrecht, PhD, Lead Evaluator, Missouri Asthma Prevention and Control Program; Principal, Open Health LLC

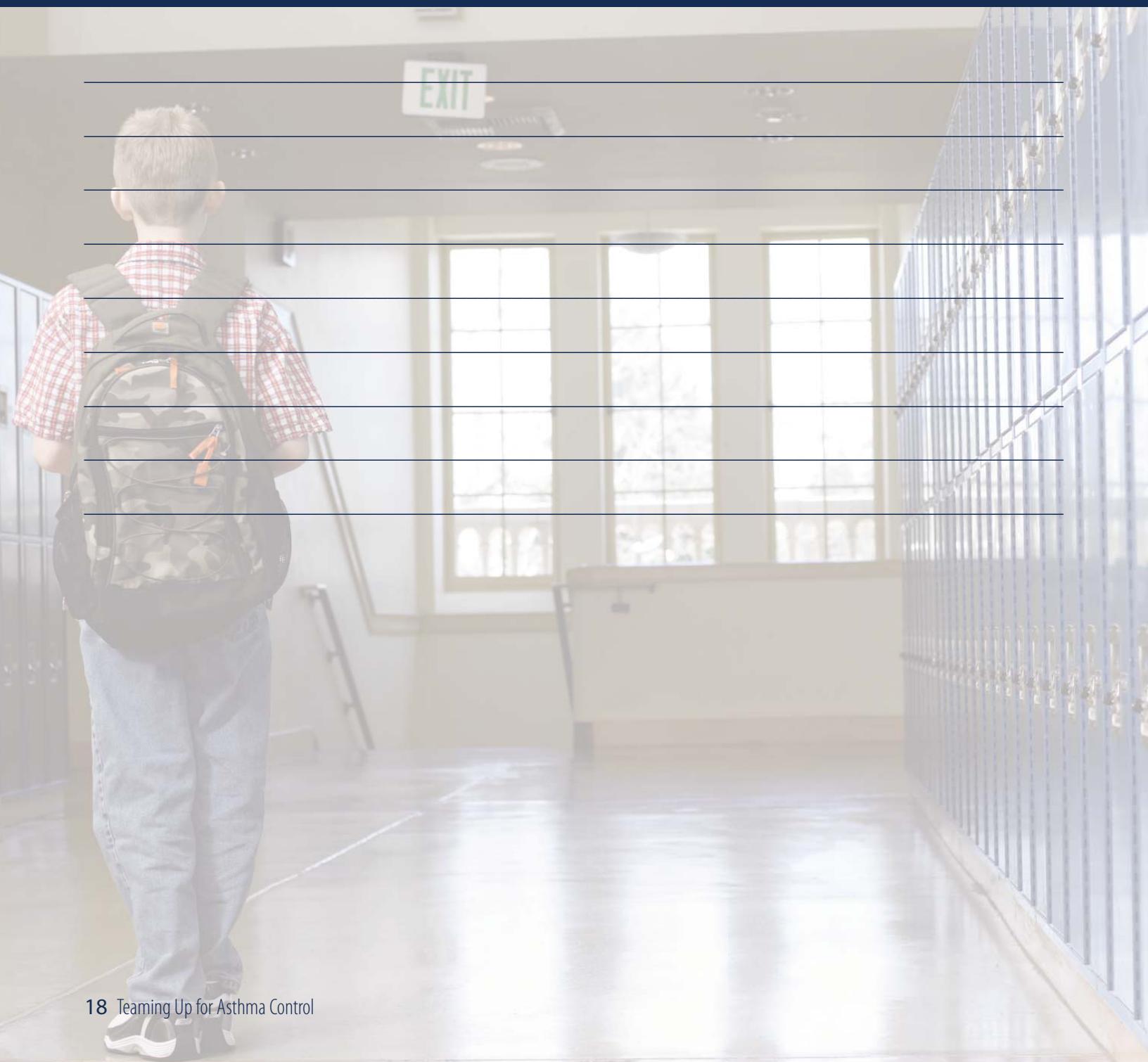
Peggy Gaddy, RRT, MBA, Asthma Program Manager, Missouri Department of Health and Senior Services

Shumei Yun, MD, PhD, State Chronic Disease Epidemiologist, Missouri Department of Health and Senior Services

# References

1. The TUAC intervention is managed by Asthma Ready Communities® (ARC®) at the University of Missouri-Columbia School of Medicine, Department of Child Health and is supported through a contract with Missouri Department of Health and Senior Services (DHSS), Missouri Asthma Prevention and Control Program (MAPCP), a U.S. Centers for Disease Control and Prevention Addressing Asthma from a Public Health Perspective grantee (U59-EH00510-05).
2. University of Missouri, Office of Social and Economic Data Analysis, Missouri Census Data Center. Master Area Block Level Equivalency (MABLE). <http://mcdc.missouri.edu/websas/geocorr12.html>
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# Notes





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